

NASA-UVa LIGHT AEROSPACE ALLOY AND STRUCTURES TECHNOLOGY PROGRAM (*LA²ST*)

Executive Summary

The NASA-UVa Light Aerospace Alloy and Structures Technology (*LA²ST*) Program was initiated in 1986 and continues with a high level of activity. Projects are being conducted by graduate students and faculty advisors in the Department of Materials Science and Engineering at the University of Virginia. This work is funded by the NASA-Langley Research Center under Grant NAG-1-745. Here, we report on progress achieved between January 1 and June 30, 1996.

The objective of the *LA²ST* Program is to conduct interdisciplinary graduate student research on the performance of next generation, light-weight aerospace alloys, composites and thermal gradient structures in collaboration with NASA-Langley researchers. Specific technical objectives are presented for each research project. We generally aim to produce relevant data and basic understanding of material mechanical response, environmental/corrosion behavior, and microstructure; new monolithic and composite alloys; advanced processing methods; new solid and fluid mechanics analyses; measurement and modeling advances; and a pool of educated graduate students for aerospace technologies.

The accomplishments presented in this report are summarized as follows.

- Three research areas are being actively investigated, including: (1) Mechanical and Environmental Degradation Mechanisms in Advanced Light Metals, (2) Aerospace Materials Science, and (3) Mechanics of Materials for Light Aerospace Structures.
- Twelve research projects are being conducted by 9 PhD and 1 MS level graduate students, 2 post doctoral fellows and 7 faculty members. Each project is planned and executed in conjunction with a specific branch and technical monitor at NASA-LaRC.
- One undergraduate was recruited to conduct research in the Metallic Materials Branch at NASA- LaRC during the Summer of 1996. No undergraduates are currently participating in *LA²ST* research at UVa.
- Collective accomplishments between January and June of 1996 include: 4 journal or proceedings publications, 1 NASA progress report, 4 presentations at national technical meetings, and 2 PhD dissertations published. Two students graduated during this